

CLAIMS

- 1 A monolithic micro or nano electromechanical transducer device including:
 - a pair of substrates respectively mounting one or more elongate electrical conductors; and
- 5 resilient solid state hinge means integral with and linking said substrates to relatively locate the substrates so that respective said elongate electrical conductors of the substrates are opposed at a spacing that permits a detectable quantum tunnelling current between the conductors when a suitable electrical potential difference is applied across the conductors;
- 10 wherein said solid state hinge means permits relative parallel translation of said substrates transverse to said elongate electrical conductors.
- 2 An electromechanical transducer device according to claim 2, wherein the opposed elongate electrical conductors mounted on the respective substrates are substantially parallel.
- 15 3 An electromechanical transducer device according to claim 1 or 2, wherein said resilient solid state hinge means is dimensioned to have a substantially lower stiffness in a selected direction relative to a direction orthogonal to the selected direction.
- 4 An electromechanical transducer device according to claim 1, 2 or 3
20 wherein said solid state hinge means comprises at least one outstanding pillar or post from one of said substrates and a web integrally joining the pillar to an edge region of the other substrate.
- 25 5 An electromechanical transducer device according to any preceding claim wherein, for detecting linear translation, said hinge means comprises a pair of said resilient solid state hinges.

- 6 An electromechanical transducer device according to claim 5, wherein said hinges include hinges webs in mutual co-planar alignment.
- 7 An electromechanical transducer device according to any one of claims 1 to 4 wherein, for detection of rotational or angular translation motion, said hinge means comprises one or more angularly spaced solid state hinges.
- 8 An electromechanical transducer device according to any one of claims 1 to 7, wherein the respective substrates are planar plates or wafers, one overlying the other.
- 9 An electromechanical transducer device according to claim 8 wherein said plates or wafers are rectangular.